



TRansition paths to sUstainable legume-based systems in Europe

Development of PAT-led agronomy for combined systems

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The Challenge

Modern arable broad-acre crop production is typically optimised for monoculture. This has led to the rise of a range of key challenges, including increasing soil erosion and surface water pollution levels, decreasing soil fertility and degrading soil structure and biotic health. There is also a reliance on external inputs (such as fertilisers, and pest and weed control products), with the lack of in-field diversity able to support pest and disease burdens.

In order to achieve sustainable intensification in agriculture, it will be essential to address and resolve these key challenges and move away from conventional monoculture, while also maintaining or maximising potential yields.



Potential Solutions

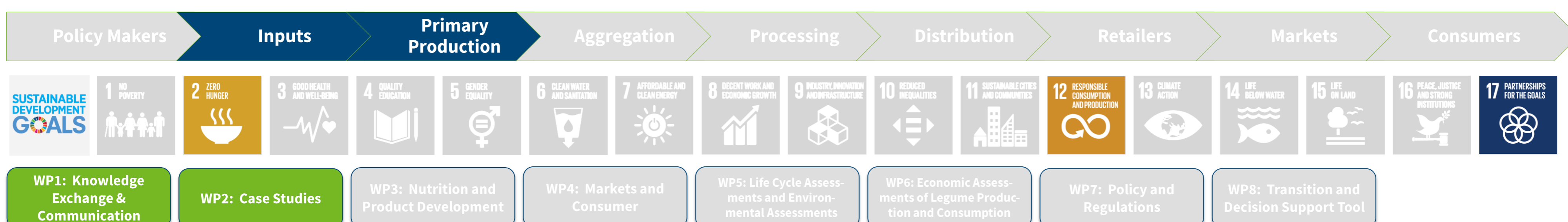
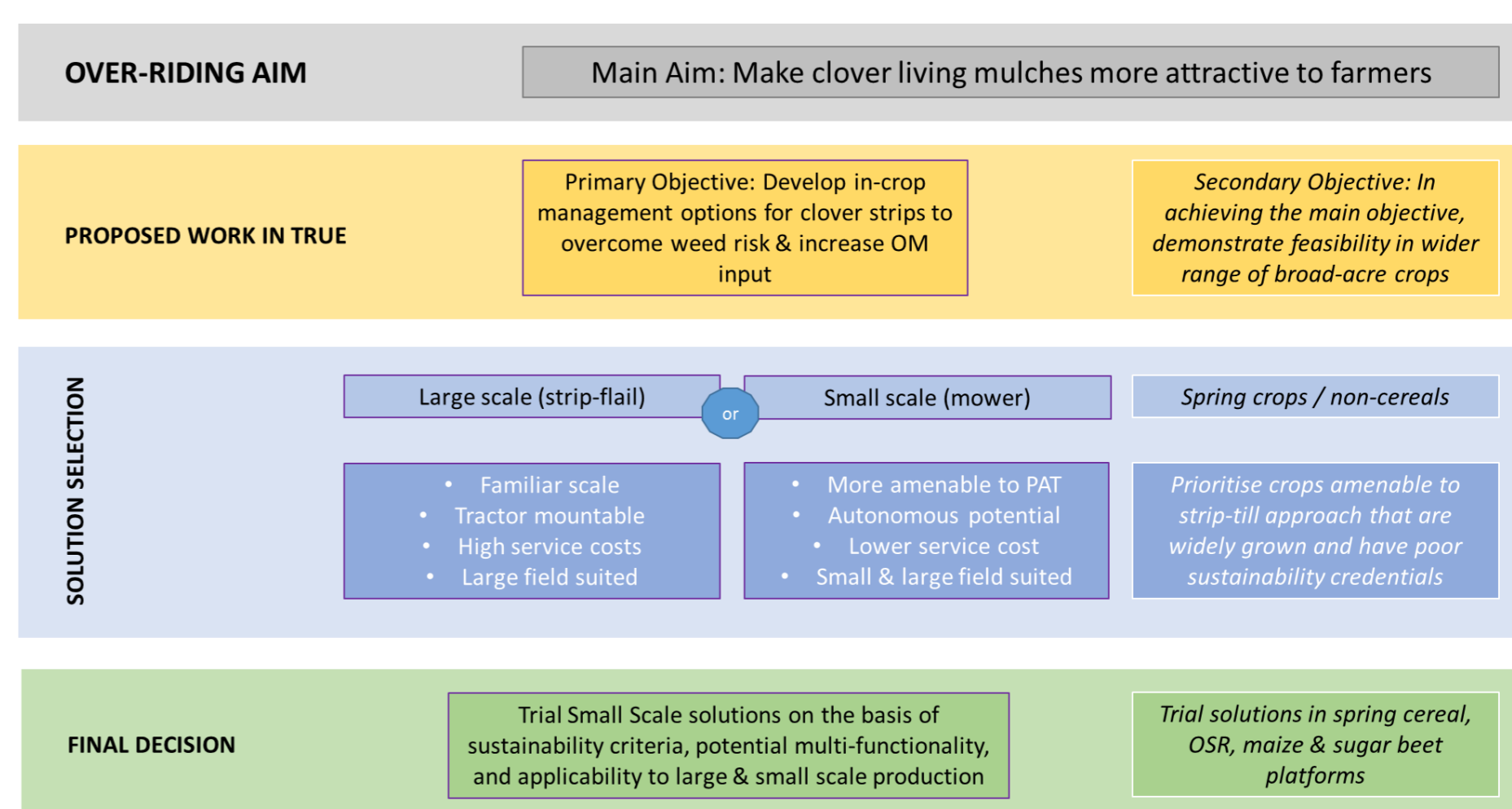
Legume-supported polyculture has been shown to be able to address multiple key challenges being faced in the arable sector, including soil erosion control and surface water pollution reduction. Living mulches, for example, can provide a range of soil benefits, including greater productivity, soil fertility, added organic matter and soil nitrogen availability, and improved soil structure. They can also improve soil biotic health, with positive impacts on micro- and macro-fauna (such as earthworms), while helping reduce pest and weed burdens when well-managed.

Nonetheless, establishment and important management issues (for example slug and elements of weed control) still need to be addressed and resolved in order to encourage uptake. There is also a lack of evidence and management options applicable across multiple broad-acre crops.

The Case Study

The STC Case Study will be looking at ways in which in-crop clover living mulches can be managed within growing seasons, in both large- and small-scale fields and production.

Using Precision Agriculture Technology assisted strip-tilling techniques, management options and agronomic approaches will be validated in a range of broad-acre crops (such as spring cereals, maize, oilseed rape and sugar beet). New machinery solutions with the potential to optimise living mulch management will be developed in collaboration with a PAT-specialist.



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